Geo. 0278 1456 1

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOOSE-LEAF FIELD NOTEBOOK

9-137

doc. 027B

doc 27B

CONTENTS

		Page
7048	Fox Hills reconnaissance and collecting, July 1956	1 to 15
7787	Notes for revision Inyan Kara paper	16.
	Brief notes on Thermop-Cloverly in SW. Wyo. and adj. areas.	17-

Fox Hills

	Page
loc 20	4 to 5
loc 24	5
[loc. 21]	4
loc 42	14
loc 43	8
loc 44	1-3

July 11 Lantry Dam locality.

Fox Hills here has upper ss member of massive buff friable somewhat argill. ss. (Sample) with scattered concretions - loc in zones but not consistent. This in cut of old U.S. 212 to S in cut for spillway lower beds appear. Begin to get more shaly, few concretions but indiv. large "conradi" This is a finer ss with sh blebs & irreg small lenses transitional with ss above. Is structureless for most part & irreg jointed

July 12 Seeman Park locality, Linton N.D.
See old notes from Stotler for some of details.

loc H-H

Around on W side of hill with cut-bank in park is gulley with slopes.

Fossil lots as follows.

A. From large concs about 2' above top of sulphur zone. Latter here about 3' thick. Concs. sandy, snow laminati. & thin bedding, some borings. Have huge Gervillias loc. & few ammonites.

B. Loc. concs similar to those in A above. With numerous Gervillia

of moderate size.

C. A single small conc in slope about 3' below sulphur zone. Probably not in place.

D. Nicolleti concretion in float. Comes from just above sulphur zone.

(E) Cut bank at Park

25'± Fox Hills with concs at base
3'± Yellow sulphur zone
Elk Butte member - 50-75 no recd

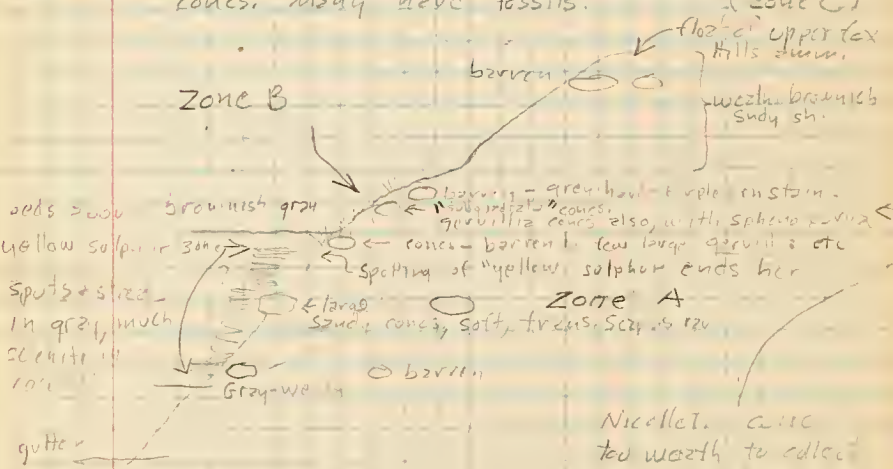
Large - red burn weath Gen. Elk concs about ↑ feet above base.
(3 W's)

Change from Elk Butte is sharp here. Top Elk Butte is grey irreg lb ss + sh Sulph. str. On top uppermost Sulph. Sharp change to tan ss ~~with~~, avg lb ~~shale~~ Thin bedded at base, more massive above. Dirty. Nodules "Sulphur", prob. weath. pyrite

Upper part of Fox Hills not well exposed in Linton area. A platy, gray-white weathering, barren, shaly silt comes in above the basal fossiliferous zone; this has thin glauconitic ss at top, but it is loc. quartzitic - cherty, with some red jasper in it. Has fragments - fossils incl. ammonites.

July 13. (A) Route 12 S.D., road cut just S. of Wakpala. This is same one Colton + I visited in 1949.

Lower part is light gray weath. sndy sh. with gyp. - Elk Butte? Has some big barren concs.
Above, darker grey, also gypsif. with concs. Many have fossils.



July 13 (B) Road cut thru Trail City member just north (2 mi) Little Eagle. Kodachrome shows fault with TiC. membs down to S.

Loc. 20

Rough section.

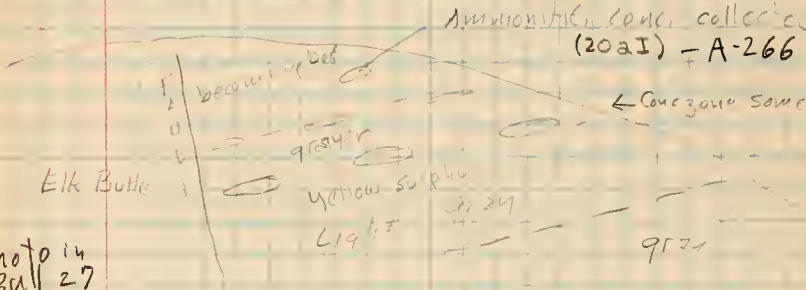
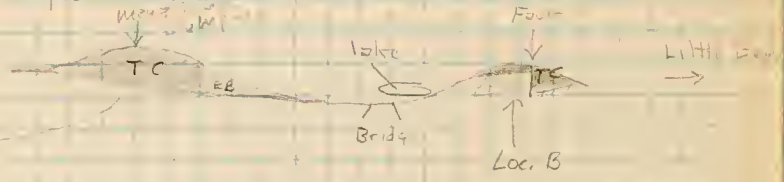


photo in Bull 27

C. 2nd Rd cut in Trail City memb. N. of Little Eagle



[loc. 21]

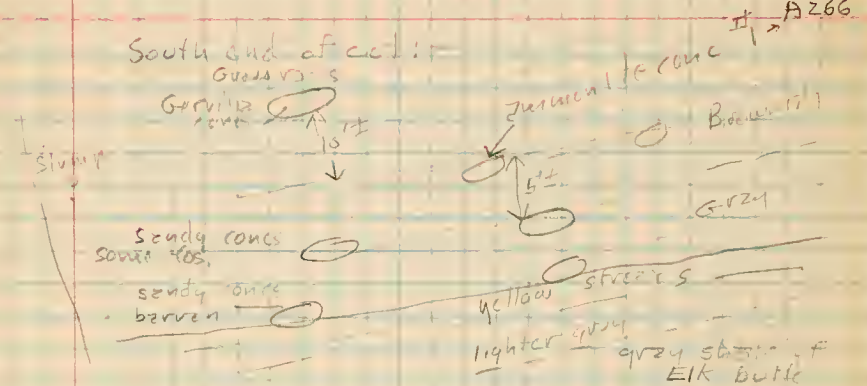
Three list fossils from here.

3. Is from Ground conc. layer (A267)

2. Inoceramus just below 1

1. Ammonitic fr. conc. (see photos) (A260)

Another sec. at top of bluff with large sphenos.



July 14 - Loc. 24 Road to Bullhead.

SE Cor Sec. 24 across from house

On S. side road Trinacrodia beds in Fox Hills - some spectacular exposures with Halyniacites & shell beds.

Loc. Bullhead, bluffs N. Bank Grand River. Just S.W. of village

Good section. From Pierre to base Timber Lake member.

Most ammonites from zone Protocrodia concs abt 10 or 12' above road. These have mostly fragmental Am., & some Sphenos, some Pt. nebrasc., Scaph. Gervillia.

Zonation of concretions is not clear, but Gervillia concs and Protocrodia-ammonite concs

occur close together, former possibly above.

Ammonites in protocardia concs chiefly multinodose types, nicolletii's are rare. This distrib. needs explanation.

July 14 – Fort Yates reconnaissance.

The Trail City not exposed around Fort Yates. North of town zone large "cannonball" type concretions contain sparse fauna including large Sphenodiscus. Relation to Tancredia-Halymenites zone not determined.

General notes on Fox Hills.

According to Stevenson, no types for either Trail City or Timber Lake members. S. D. Survey practise is to call it T.C. with first sand in shale, and carry it up to first marine sand, which is Timber Lake.

If these two units are persistent, and they appear to be, then faunal distribution in them is peculiar and needs explanation.

Example is Timber Lake member. In Corson Co. has Tancredia-Halymenites locally – may be restricted to part. Locally some Gonnilia concs., but

no prolific ammonite fauna as at Lantry and vicinity. At Ft Yates appears, some Sphenos at or above loc. Tenuicostia.

At Linton only Trail City recognizeable, some fragmentary fossils in upper greensand.

Some needed study.

1. Areal distribution of the prolific Trail City ammonites. Sediment study.

2. Faunal distrib & accomp sed. study of Timber Lakes

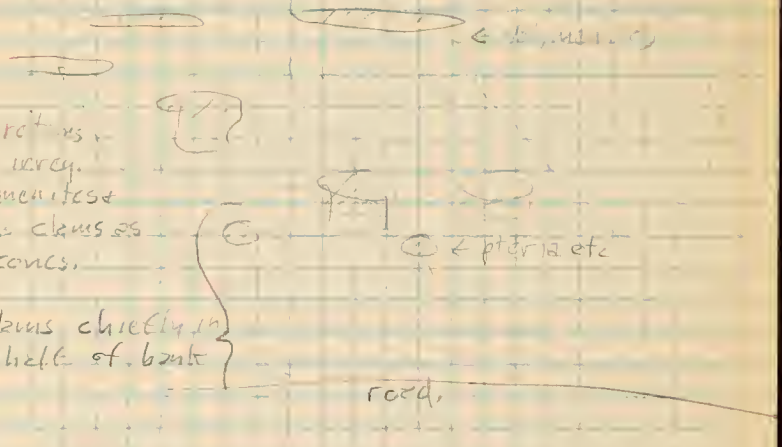
3. Pickup of T.C. forms to S. and SW. - are the included in Elk Butte membs. S. of Moreau? Is Trail City distinct S. of Moreau?

4. Strat. section study from Stoneville - east onto Fox Ridge, NE to Morcau-Grand area, thence up Mo in N.Dak & across Mo.

5. Study of conc. and matrix at various localities.

July 15
Loc 43

Road cut in [illegible] N. of Little Eagle. (Little Eagle Sand cut)
Looks like Landing Dam thin type with big & small CB weathered concs. and friable sand with fossils. Fossil in sand. Pteria, Ostrea, Callista?. In concs. Pteria much carbonized wood. Collections from conc. & loose sand. Up top of cut is conc. layer with Halymenites.


Big concretions, mushroom & irreg. have halymenites & rare pteria clams as in small concs.
Loose clams chiefly in lower half of bank
pteria etc
road.

July 15- Move notes on the Bull Head locality.

The old road along river bluff used to be main road. Locality cut thru the zone fossiliferous [illegible] just above base of Trail City memb. and these fossils into river. In place between river and road some can still be seen in place. Incl. [illegible] type concs in yellow-spotted zone, but some float

including a large Agantho-like in pieces which come from here. Chief fossiliferous conds are just above sp. zone. Great variety here including

1. Gervillia type – few Discos, but these chiefly spinose.

2. Large conds, part bizarre, with nobs of snail concentration and many little sphenos. Also spinose types, but nicolli-ti's too, the latter not common

Some have Protocardia dominant.

3. Dense protocardia conds. These found in place and are locally well up in fossiliferous zone.

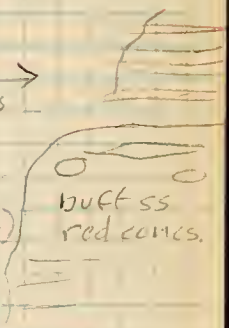
4. Large Gervillia conds, also have ammonites

Completely ammonitic conds. – that is dominantly, not found. Gervillias and Protocardia dominate. Some nautilus, rare belemnite. Frags of pavgmu- cones.

Bull Head conds generally are not complete. Have crush areas, other fossils pressed into them.

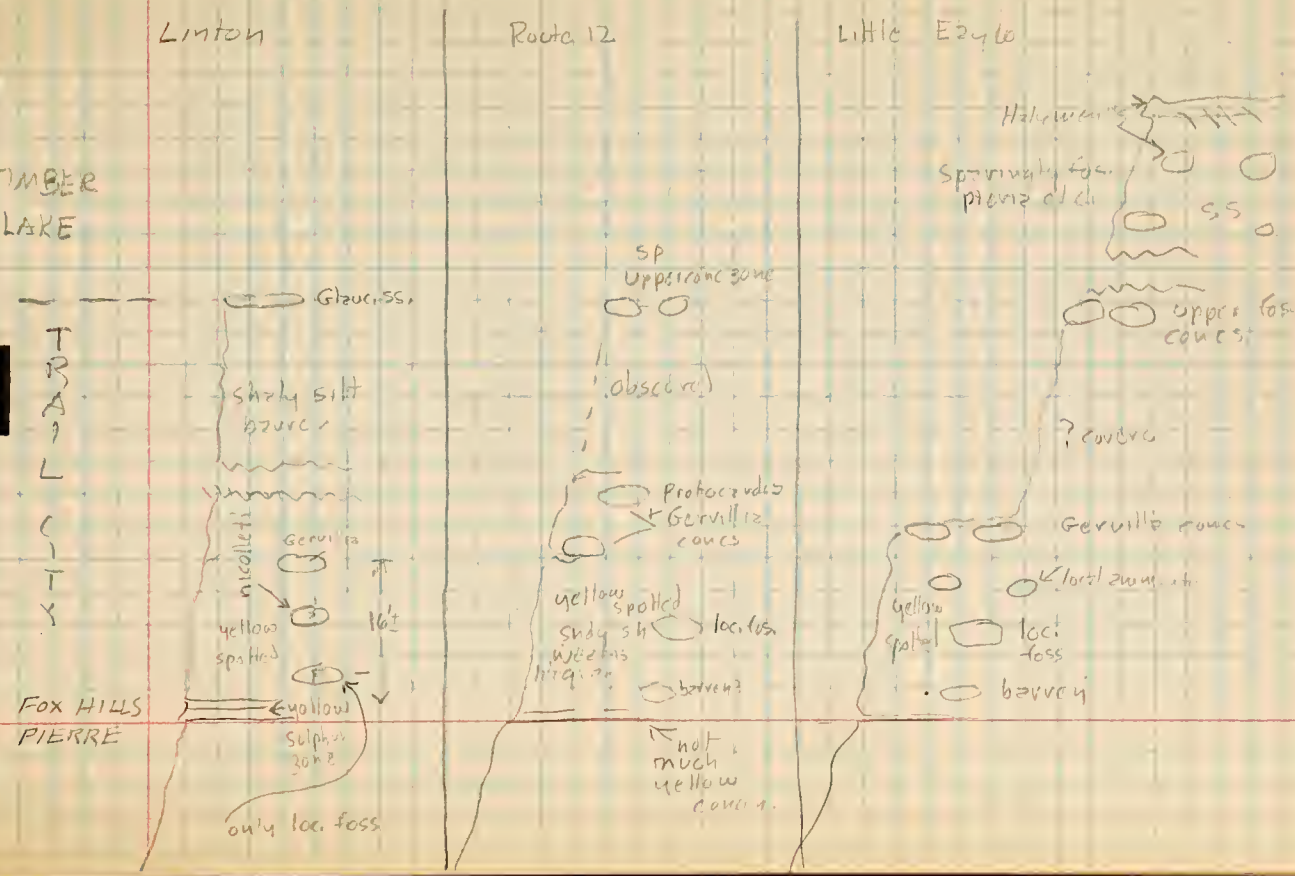
Rough generalized section of Fox Hills at Bull Head

Rd cut east Bull Head top of bluff shows alt. ss + sh banded "Fox Hills, Tenneredia beds may cap this in flats to east ?☆

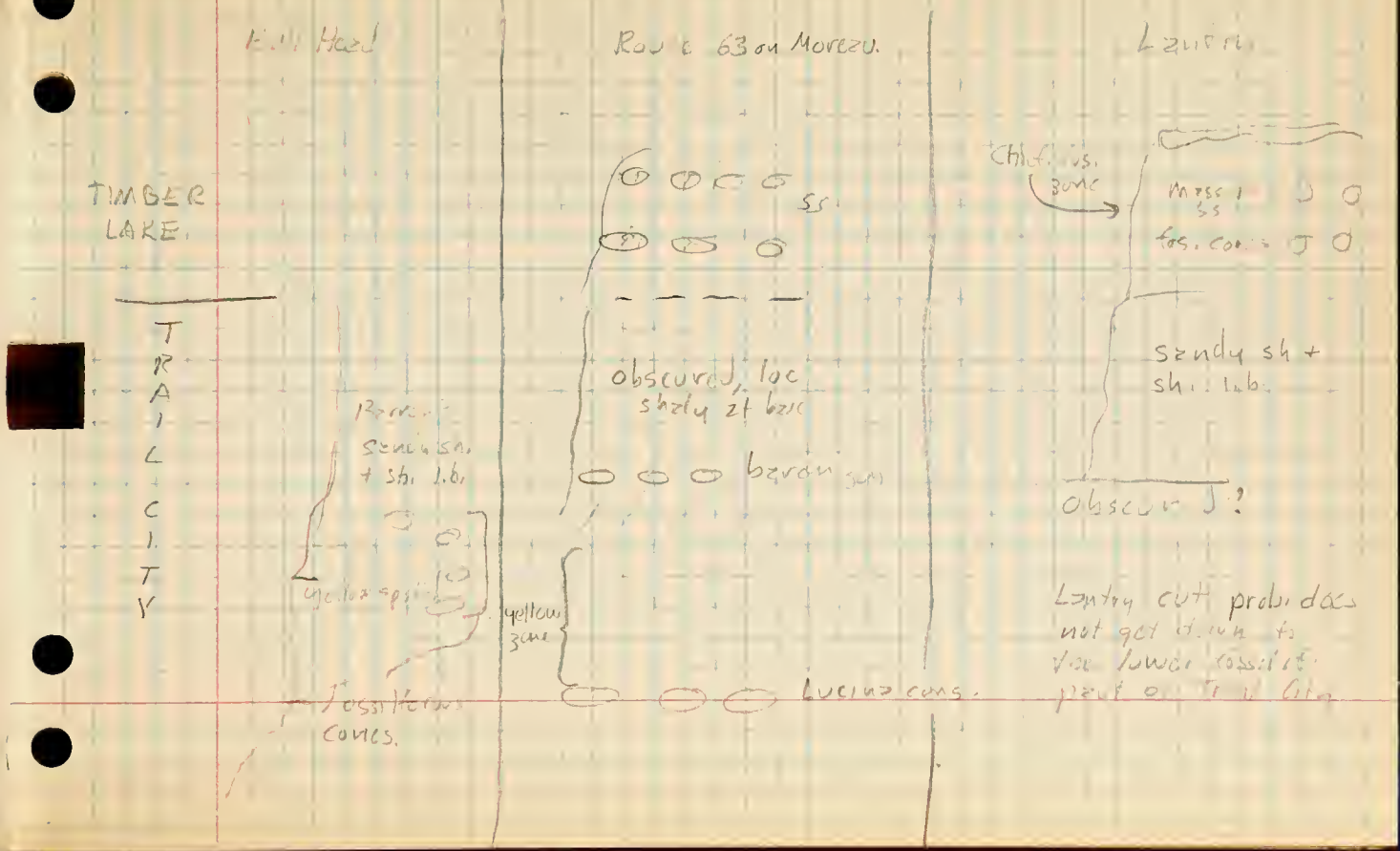

Some fossils in this sand (Sand of Little Eagle sandpit)
buff ss red cones.
This part barren
intercalated ss & sh
Fossilif. conc. zones — sometimes obscure
Road
barren?
yellow-spotted beds Trail City
Contact with Pierre would have to be dug out
River

☆ Possibility that Tenneredia beds are topmost Fox Hills ss but needs checking.

Possible relations of various collecting localities



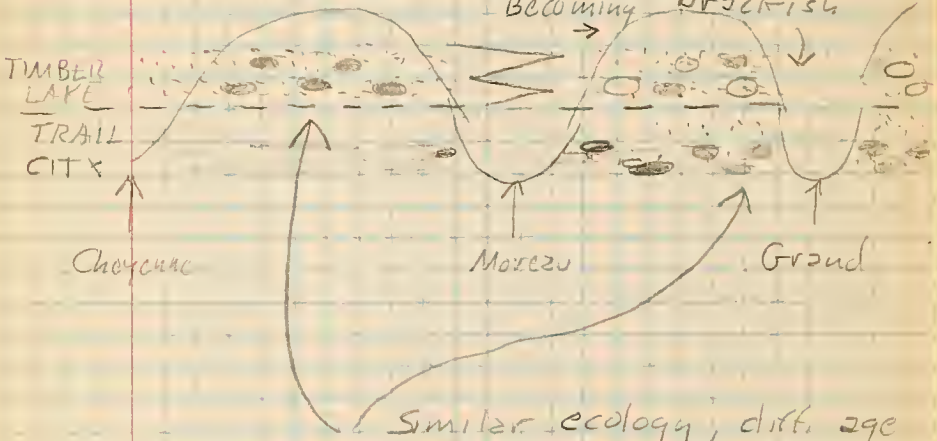
Relations collecting localities (cont.)



Notes on sections collected.

Timber Lake. - appears to become less fossiliferous north of Moreau. Prob. more brackish, as Helymentes counts in - even in Ca.S. Most fossiliferous on Cheyenne Moreau divide. (Landry, Eagle Butte)

Trail City - Reverse of Timber Lake. Most fossiliferous in Corson Co. & N. Dak, whereas in Cheyenne-Moreau divide it is apparently grading off into Pierre. This indicates rather definite N-S. pattern

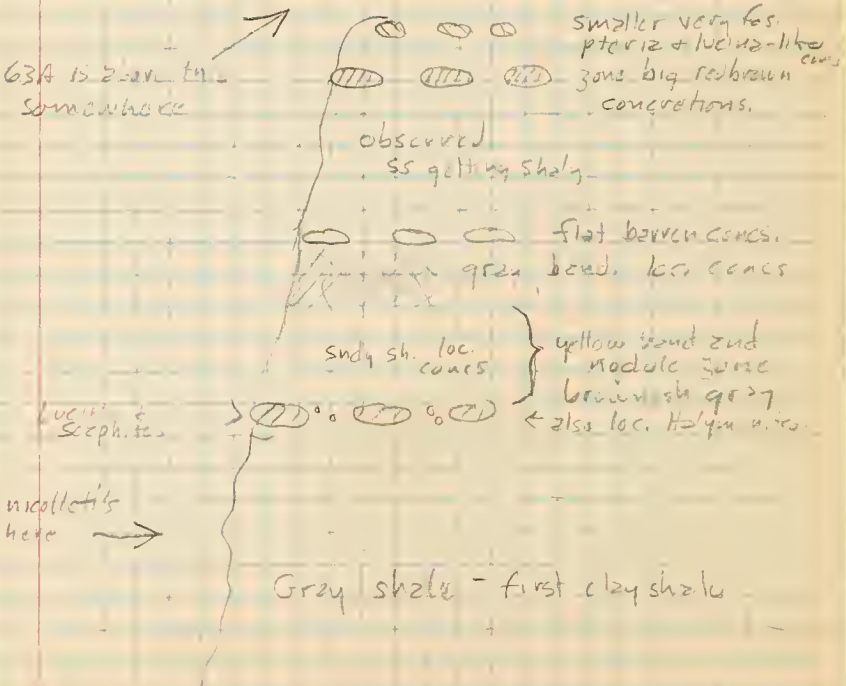


July 16 - Rt. 63 reconnaissance (See Parade NW sheet for localities)

loc 42

63 A. (kodachromes) road cut in Timber lake?. Soft gray sandstone weaths buff, slightly glauconitic (?). Has discontinuous layers rebrown conc. ss with Halymenites. In sand are Pteria, discoscaphite frags, and part large sphenodiscus. Other unident. invertebrates.

63 B This is old #13 Elk Butte — Fox Hills section (Den took kodachrome). Breaks of Moreau in this area (north side) afford chance for working out good sections, and found succession


63A is somewhere in
smaller very fos. pteria & lucina-like corals
zone big rebrown concretions.
obscured
ss getting shaly
flat brown concs.
gray bent. loc. concs
sndy sh. loc. corals
yellow sand and module zone
brown sh gray
also loc. Halym. nits
Some nicolletti's down here
Gray shale - first clay shale

Distribution of various fos. concretions needs to be worked out. All layers should be thoroughly checked because fos. distribution is variable.

The upper sandy pit with red-brown concretions probably = Lantry Dam stuff and obscured zone probably = the shaly sand at Lantry spillway

For revision of Inyan Kara paper

1. Section in Stony Hill quadrangle - should be credited to Nagel. - Not 220, more it approx 170

2. Not enough emphasis on lithic change across disconformity. - Put more in on section on contact and check all sections

3 Check remarks on Fall River channel directions

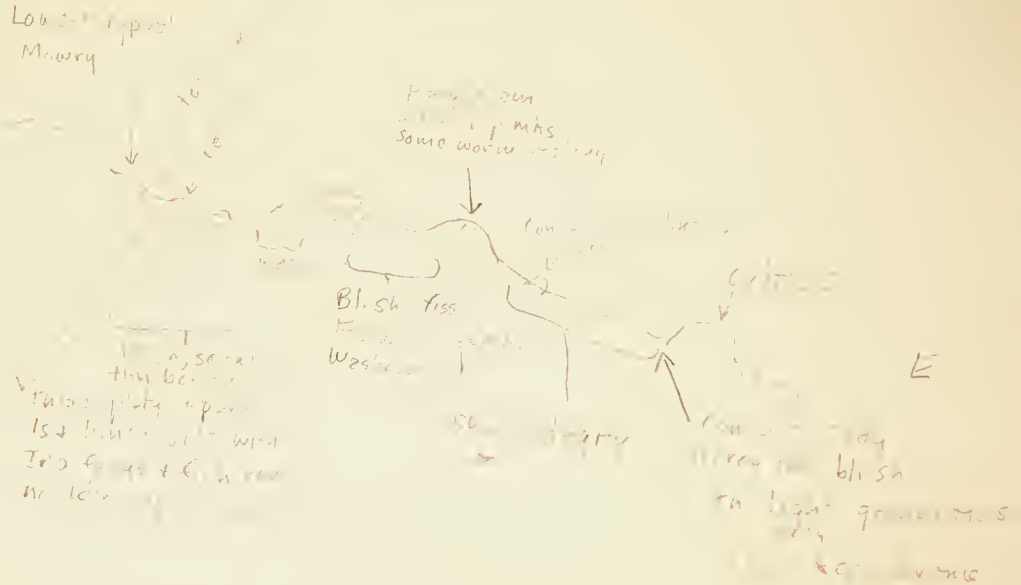
Notes on Cloverly in So. Central Wyoming & Adj. areas

Red Buttes area: At road cut on Wyo 220
Mowry - well exposed, considerable soft sh at top.
"Muddy" a ledge former
Thermop. with black sh. poorly exposed,
some worm-tracked silts.
No contact with Cloverly exposed.

Farther west, near narrows through "Muddy", Cloverly consists almost entirely of ss and cgl ss. In bluffs S of Wyo 220 a cgltc, light buff-white weath ss, massive, X-lam, locally friable is at top. It either grades to or is underlain by a massive, harder, conglom cgl ss with chert + qtzite pebbles up to 1½" diam, commonly inch or a little under.
Locally softer clsty layers some white (Porcellanite?) clsty near top.

Conspicuous absence of "rusty bed" sandstone. Slope above cgl ss shows some fleets of brn ss in 1' ledges but contact itself not exposed anywhere. At best the Plainview equivalent here consists of 2 single thin ledges of hard ss.

W

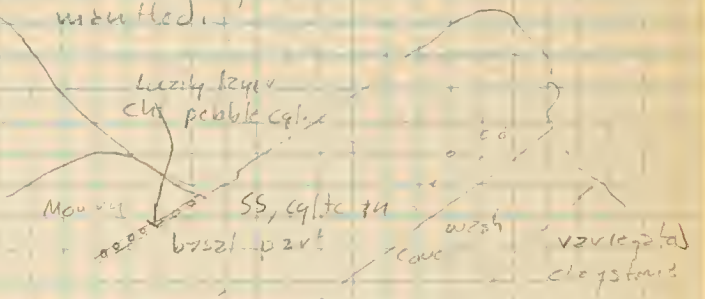


S of Alcova complete section can be pieced from Sundance — Mowry (see if Loves chart has it.)

Contact is black sndy sh right on top cgltc ss with no "rusty beds", no evidence leaching, - Cloverly is all cgl loc except for thin zone czsh clstn sh between the 2 cgls. Upper is cgltc Xbedded white sparkly ss, Typical Lytle-like, Lower is very good cgl pidgeon to chicken egg chert qtzite pebbles.

At Ohio Oil Co. well (Antelope Flats Govt #1) area in Spring Cr. area, Co. geologists show 3 ss separated by shaly beds in Dakota. (Bob Steed, Casper office, has this report - could probably get it if necessary.

Dakota in hogback between Messa-dome and Blue Mt. Chiefly a single ss., calc layer on top, calc in basal part. Nothing but clastics in crop below but beds immediately under ss are mantled.



South toward Blue Mt., the "Dakota" hogback becomes a double unit. Suspect that at loc. depicted in section the two ss. have coalesced.

Exposure all along this extensive hogback are good and afford basis for final "two dimensional" study.